

TPS61322-BMC001 Evaluation Module

This user's guide describes the characteristics, operation, and the use of the TPS61322EVM-001 evaluation module (EVM). The EVM contains the TPS61322 device, which is a high-performance, high-efficiency, synchronous boost converter, with only 6- μ A quiescent current. The user's guide includes the EVM specifications, recommended test setup, test result, schematic diagram, bill of materials, and board layout.

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1 Introduction

1.1 Performance Specification

Table 1 lists a summary of the TPS61322EVM performance specifications. All specifications are given for an ambient temperature of 25°C.

Table 1. Performance Specification Summary

Specification	Test Conditions	MIN	TYP	MAX	UNIT
V_{IN}	—		1.2		V
V_{OUT}	TPS61322 EVM, $V_{IN} = 1.2$ V, $I_o \leq 0.1$ A		2.2		V

1.2 Modification

The printed-circuit board (PCB) for this EVM is designed to accommodate some modifications by the user. The external component can be changed according to the real application.

1.3 Input Capacitor

A 150- μ F, tantalum capacitor, C1, is added as the input capacitor in the EVM. The ESR of the tantalum capacitor is 0.1 Ω , which helps to damp the ringing of the input voltage when the EVM is powered by a power supply with a long cable. The capacitor is not required for proper operation and can be removed in a real application.

1.4 Output Capacitor Selection

A 22- μ F, ceramic capacitor, C3, is added as the output capacitors. This capacitor can ensure the low-output ripple at heavy load condition.

2 Test Setup

This section describes how to properly connect, set up, and use the TPS61322EVM-001 device.

2.1 Input/Output Connector Descriptions

J1-VIN — Positive input connection from the input supply for the EVM

J3-GND — Return connection from the input supply for the EVM

J4-VOUT — Positive connection for the output voltage

J6-GND — Return connection for the output voltage

3 Schematic, Bill of Materials, and Board Layout

This section provides the TPS61322EVM-001 schematic, bill of materials (BOM), and board layout.

3.1 Schematic

Figure 1 shows the TPS61322EVM-001 schematic.

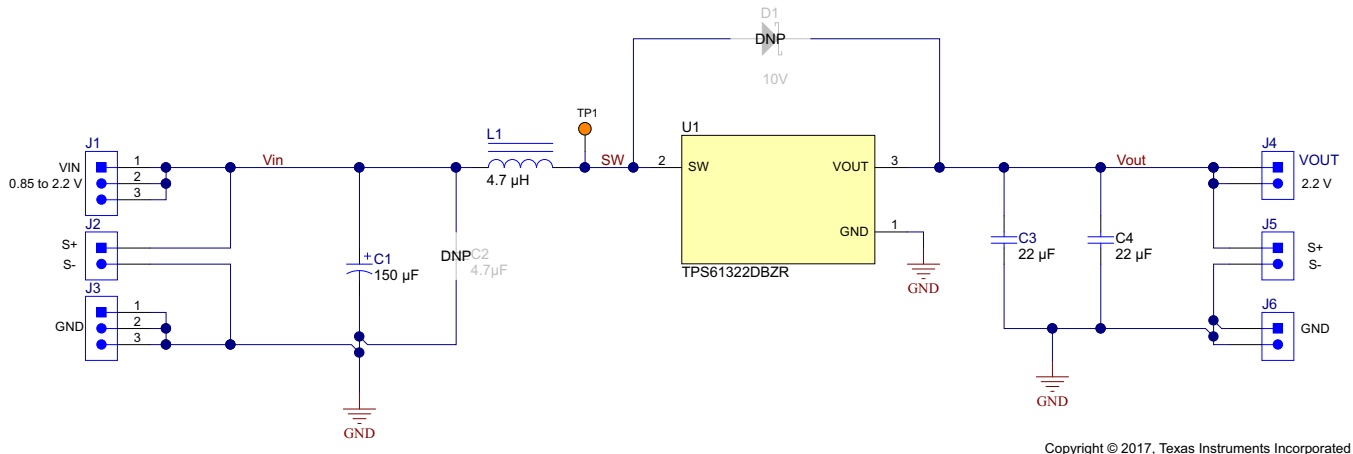


Figure 1. TPS61322EVM-001 Schematic

3.2 Bill of Materials

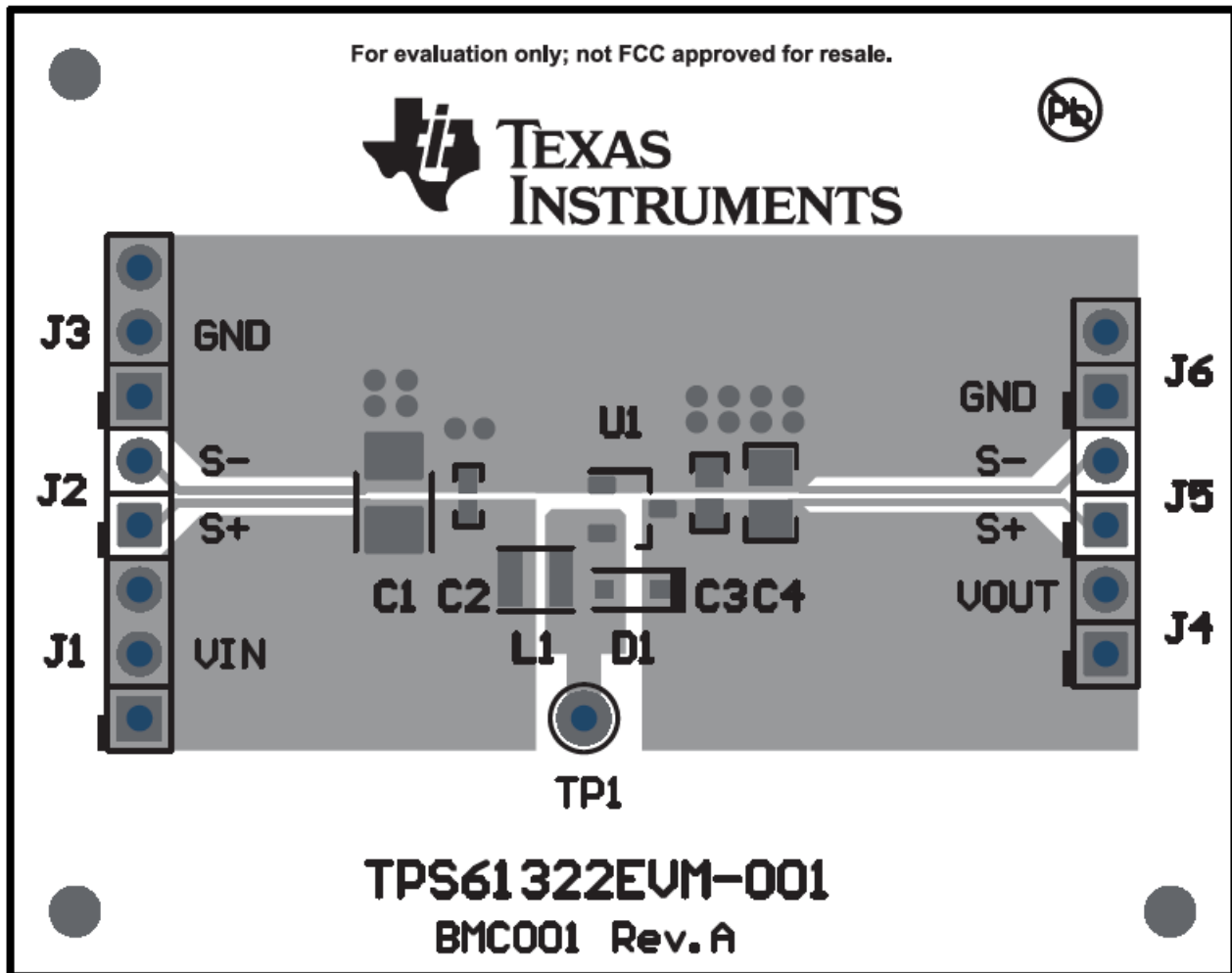
Table 2 lists the BOM.

Table 2. Bill of Materials

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer
C1	1	150 µF	Capacitor, TA, 150 µF, 6.3 V, ± 20%, 0.07 Ω, SMD	3528-21	T520B157M006ATE070	Kemet
C3	1	22 µF	Capacitor, ceramic, 22 µF, 6.3 V, ± 20%, X5R, 0603	0603	GRM188R60J226MEA0D	MuRata
C4	1	22 µF	Capacitor, ceramic, 22 µF, 16 V, ± 20%, X5R, 0805	0805	GRM21BR61C226ME44L	MuRata
J1, J3	2		Header, 100 mil, 3 × 1, Gold, TH	3 × 1 header	TSW-103-07-G-S	Samtec
J2, J4, J5, J6	4		Header, 100 mil, 2 × 1, Gold, TH	2 × 1 header	TSW-102-07-G-S	Samtec
L1	1	4.7 µH	Inductor, shielded, powdered iron, 4.7 µH, 0.15 A, 0.19 Ω, SMD	2.5 × 1.2 × 2 mm	DFE252012F-4R7M=P2	MuRata Toko
TP1	1	Orange	Test point, miniature, orange, TH	Orange miniature test point	5003	Keystone
U1	1		6-µA quiescent current, 2-A, switch current boost converter, DBZ0003A (SOT-23-3)	DBZ0003A	TPS61322DBZR	Texas Instruments
C2	0	4.7 µF	Capacitor, ceramic, 4.7 µF, 10 V, ± 20%, X5R, 0402	0402	GRM155R61A475MEAAD	MuRata
D1	0	10 V	Diode, Schottky, 10 V, 0.75 A, SOD-323	SOD-323	ZLLS410TA	Diodes Inc.

3.3 Board Layout

Figure 2 and Figure 3 show the TPS61322EVM-001 board layout.



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Figure 2. TPS61322EVM-001 Top-Side Layout

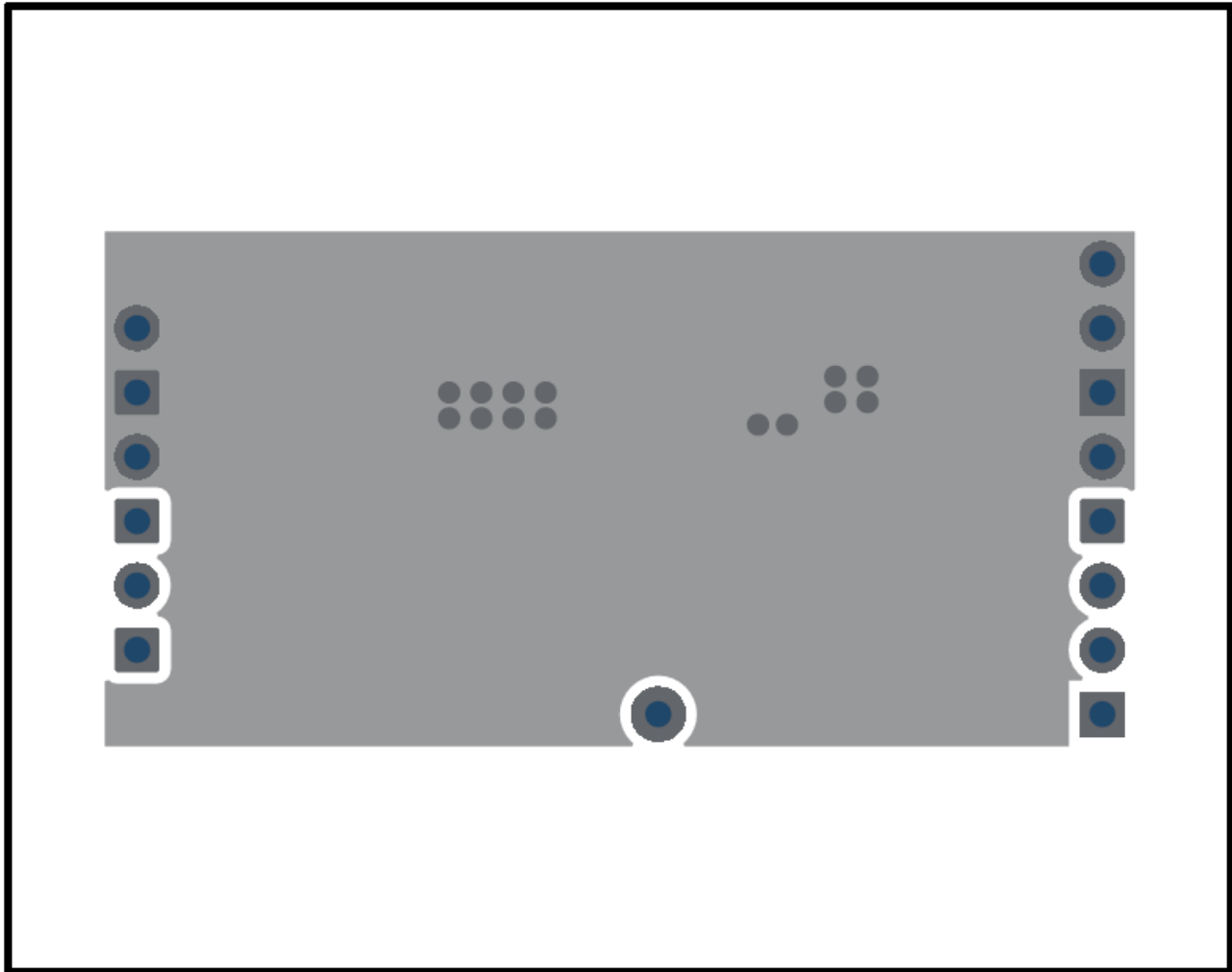


Figure 3. TPS61322EVM-001 Bottom-Side Layout

Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from June 23, 2017 to November 7, 2017	Page
• Changed <i>TPS61322EVM-001 Schematic</i> image	3
• Changed <i>BOM</i> table	3

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This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

3.2 Canada

3.2.1 For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210 or RSS-247

Concerning EVMs Including Radio Transmitters:

This device complies with Industry Canada license-exempt RSSs. Operation is subject to the following two conditions:

(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Concernant les EVMs avec appareils radio:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Concerning EVMs Including Detachable Antennas:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

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http://www.tij.co.jp/lstds/ti_ja/general/eStore/notice_01.page

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If User uses EVMs in Japan, not certified to Technical Regulations of Radio Law of Japan, User is required to follow the instructions set forth by Radio Law of Japan, which includes, but is not limited to, the instructions below with respect to EVMs (which for the avoidance of doubt are stated strictly for convenience and should be verified by User):

1. Use EVMs in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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